the dogs' quarter. In commemoration of the event, O'Dowd had the annexed representation of it carved on the stone, and placed in the wall of his baronial residence.

The Secretary read the following "Collection of Notes on the early History of Science in Ireland." By James Orchard Halliwell, Esq., F. R. S., F. S. A., F. R. A. S., &c.

" The following scraps on a subject which has never yet been treated of by any writer with whose works I am acquainted, although unfolding no views of any great importance, will, it is believed, form a subject of discussion interesting to all natives of Ireland, who would think favourably of the intellectual character and resources of their countrymen.

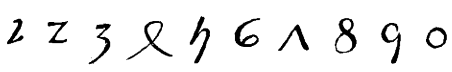
" The earliest remnant of Irish science that I have met with, is contained in MS. Arundel, *333*, in the British Museum, which contains several medical and astrological tracts in the Irish language of the thirteenth century, together with similar tracts of the fourteenth and fifteenth centuries. These tracts are of a similar nature with contemporary manuscripts written in England and on the continent.

For instance, at fol. 27, is an extract translated from the treatise of the venerable Bede, "De Divisionibus Temporis;" at fol. 35, is a short tract on the months of the year and their several durations; at fol. 76, is a scrap on the four seasons of the year, and on the planets which govern them.

"The whole volume contains astrology, mixed with the sciences of medicine and astronomy. Medical manuscripts in Irish of this early period are more numerous than others; and the Egerton collection in the British Museum contains several; one dated in the year 1303, and written on the continent.*

"Some writers say, that Johannes de Sacro Bosco, the contemporary of Roger Bacon, and who shines so conspicuously in the history of the mathematical sciences of the thirteenth century, was a native of Ireland; but, whatever obscurity may hang over the actual place of his birth, it is certain that he resided nearly the whole of his life in England and France, and there is nothing to show that his writings were ever circulated in that country.

"Be this as it may, yet it appears from MS. Egerton, No. 90, that the Arabic numerals usually, though erroneously,† ascribed to Roger Bacon, were well known and understood in Ireland at the commencement of the fourteenth century. The document contained in this volume is very valuable evidence, in the absence of any other as early. The MS. referred to contains an astronomical and ecclesiastical calendar, together with a table of ecclesiastical computation, all in the Irish character, and the numerals are written in identically the same form as they appear in foreign documents of the same period:—



"The introduction of the zero is a proof, that the Arabic

* MS. Egerton, No. 89.

† See my Rara Mathematica, p. 114.

notation was fully understood by the writer of the manuscript. It may be added, that there follows, immediately after the documents just mentioned, a table of the twelve signs of the zodiac, with their different astrological influences, viz.: Aries = good; Taurus = evil; Gemini = evil; Leo = evil; Virgo = evil; Libra = good; Sagittarius = good; Capricornus = evil; Aquarius = good. The others are said to neutralize their influences.

"In the Philosophical Transactions of the Royal Society of London,* Dr. Ward has given an account of a date in Arabic numerals found on a stone in Ireland, which he considered to belong to the twelfth century. Professor Peacock, however, in his History of Arithmetic, has ably confuted this conjecture.

"The Liber Niger of Christ Church, Dublin, is said to contain 'a curious treatise on arithmetic, exhibiting the state of that science before the introduction of Arabic numerals.'† I much question the accuracy of this statement, and should be rather inclined to think, that it is merely an account of the numbers of algorism, so common in manuscripts of this class. The same volume also contains, a transcript of the French poetical treatise entitled 'Imago Mundi,' one of the most curious unpublished scientific tracts of the middle ages. This latter treatise is now in the progress of publication, by the Historical Society of Science.

"But by far the most curious document that I have met with relating to the early science of Ireland, is a manuscript in the possession of C. Wright, Esq., of Cambridge, who has kindly allowed me to make use of it, and has also furnished me with a translation of the greater part, which has been of great assistance to me. This MS. consists of six folio leaves on vellum, slightly injured by damp, apparently

* For the year 1745, p. 283.

† Report on the Public Records of Ireland, p. 307.

belonging to the early part of the fifteenth century, and containing the following articles:

" 1. A brief treatise on arithmetic.

" This unfortunately commences imperfectly in the account of the rule of duplation; ' In duplation only one order of figures is necessary: in the three preceding kinds, we commenced from the right and from a smaller figure; but in this this, and the following kinds, we commence from the left and from a larger figure. For if you wish to double from the first figure, it happens that you must double it twice. And if you can in any other manner commence from the right hand, the operation and construction will be much more difficult. If, therefore, you wish to double any number, that number must be written by its differences, and the last number must be doubled. From that duplation, therefore, either results a digit, an article, or a composite. If a digit, it must be written in the place of the other blotted out. If an article, a 0 must be written in the place of the other blotted out, and the article must be removed towards the left hand. If a composite number, the digit which is a part of that composite must be written in the place of the other blotted out, and the article be removed to the left hand. This being done, the last figure must be doubled, and whatever thence arises must be dealt with as before; but if a cipher turns up, it must be left untouched. We prove duplation by means of mediation.'

" This extract will be sufficient to give an idea of the whole tract. After this rule, follow those of multiplication, division, and progression in their proper order. For the comprehension of the uninitiated in the old arithmetic, it may be necessary to state, that a digit is any number below ten, an article is ten, or any multiple of ten, and that all other numbers are composites, or composed of an article and some digit. My friend Mr. Wright, gives it as his opinion, that this tract is a translation from the Latin or French.

" 2. ' Tractatus de Geometria.'

" This is an Irish tract with a Latin title, and consists of only one page, containing the simplest rules of geometrical measurement, applied to one example of finding the height of a tower. No mention occurs of any of the old geometers.

" 3. A treatise on the signs of the zodiac.

" An astrological tract with very curious drawings of the various signs. Messabalah, the famous Arabic astronomer, is mentioned at the commencement, and this tract is very probably translated from one of that author's works.

" 4. A treatise on the length of the days, in the year.

" 5. A fragment (one half page).

" This terminates the contents of this manuscript, and is written in Latin. It appears to relate to abacal arithmetic, but as I confess myself unable to understand its meaning, I give it here entire, in the hopes that some other may be more fortunate in attempting to decipher its meaning.

" Intervalla autem in quibus distribuuntur. dicimus sedes horum numerorum. qui in abaci regula secundum geometricam habitudinem sic proportionaliter ordinati continentur. ut juxta numerum novem caracterum nonis termis alternati distinctis terminis. secundum propor. * * *'

"I have pointed this exactly as in the original manuscript, but the fragment appears to be altogether unconnected.

" In addition to the above, I may mention, that in the library of Trinity College, Cambridge, under the press mark R. xiv. 48, is preserved a short poem in the Irish language on astronomy, of the early part of the thirteenth century.* And in the the Bodleian Library, MS. Rawlinson, B. 490, is a translation of the ' Secreta Secretorum,' of Aristotle, by James Yonge, on vellum, of the early part of the fifteenth

* This I learn from Mr. Wright. In the printed catalogue, it is said to be in Saxon characters.

century. This work of Young is not mentioned by Sir James Ware, nor does it appear to be at all known to Irish writers. It is almost unnecessary to observe, that this latter work has no relation with science, but its rarity is a sufficient excuse for mentioning it here.

" It will now be necessary to pass over nearly two centuries before we meet with any traces of scientific progress. Some time about the year 1600, William Farmer, ' Chirurgian and Practitioner in the Mathematicall Artes,' dwelt at Dublin; and among the manuscripts of Archbishop Tenison, at Lambeth Palace, No. 816, is an autograph MS. by him, entitled, ' A Prognosticall Almanack for this Bissextile yere, 1612, composed with a three fould Kallender generally calculated for this Kingdom of Ireland, and will also serve very well for alle the Northe and Northweste partes of England.' William Bourne also, who flourished at the same time, and greatly distinguished himself by his mechanical inventions, was a native of Ireland. To these two we may add, Nathaniel Carpenter, an Englishman by birth, but who resided in Dublin early in the seventeenth century, and left behind him treatises on geography and optics. A copy of this latter work is still preserved in MS. in the Library of University College, Oxford.*

" With Molyneux, in more recent times, the science of Ireland rose to a level with that of surrounding nations, and the names Ponce, Boyle, Petty, and Ashe,† serve to fill the complement of the seventeenth century. In January, 1684, Molyneux succeeded in forming a Philosophical Society at Dublin, on the plan of the Royal Society of London. The first meeting of the Society took place on the 28th of January, 1684, when Sir William Petty was chosen President,

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* Under the press mark L. 14. See Bernard's Catalogue, 1697, p. 5.

† Archbishop Ussher was the author of some treatises on sciences and their history, more especially astronomy.

Dr. Charles Willoughby, Director, and Molyneux undertook the combined offices of Secretary and Treasurer. November 1st, All Saints' day, was chosen for the anniversary of the Society. On the 1st of November, 1684, Sir William Petty was re-elected President, Molyneux as Secretary, and William Pleydell, Esq., Treasurer. On the 2nd of November, 1685, Lord Viscount Mountjoy was elected President, George Tollet, Esq., Treasurer, and St. George Ashe Secretary. In this year, Molyneux retired from actual office, but retained his place on the council of the Society. On the 1st of November, 1686, Lord Viscount Mountjoy was re-elected President, George Tollet Esq., Treasurer, and Edward Smyth, Secretary.

"The preceding particulars are taken from the original Minute-book of the Society preserved in the British Museum, MS. Addit. 4811.* The last entry in this book is, the account of the General Meeting of 1686, and this would lead us to suppose that the Society was dissolved at this period, although Dr. Hutton assures us, that it was not broken up till 1688.†

"From MS. Addit. 4812, it appears that in the year 1707, an attempt was made to reestablish the Society, but its success was not of any long duration, and this MS. contains a register of the philosophical papers read before the Society, from August 15th, 1707, to March 11th, 1708. The Earl of Pembroke, then Lord Lieutenant of Ireland, presided over the Society at this revival.

"In 1686, Molyneux printed at Dublin, his 'Sciothericum Telescopium,' containing a description of the structure and use of a telescopic dial invented by him. In the British Museum is preserved the author's own copy of this volume,

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* The same volume likewise contains copies of numerous letters and papers on scientific subjects, addressed for the most part to Molyneux.

† Mathematical Dictionary, vol. ii. p. 117.

enriched with numerous MS. notes, and observations, and what is particularly worthy of being noticed, an analysis of its history."

March 16, (Stated Meeting).

SIR WM. R. HAMILTON, LL.D. President, in the Chair.

On the recommendation of Council, the following gentlemen were elected Honorary Members of the Academy:

Professor Adrian, *Giessen.*
Jean B. Dumas, *Paris.*
A. Quetelet, *Brussells.*
J. O. Halliwell, Esq., *Cambridge.*

The Secretary of Council read the following Report:

In conformity with the precedent lately established, the Council, at the expiration of their year of office, beg to offer the Academy a general account of its history and progress during that interval.

The Council have to report, in the first place, that the publications of the Academy have proceeded with considerable vigour. The first Part of Vol. XIX. of the Transactions has been lately issued, and the second Part, for which many papers are in readiness, is now beginning to be printed. The first Volume also of the Proceedings, containing, along with other ordinary business, an account of the communications made to the Academy during the last four sessions, has just been published. As the quantity remaining on hands of the *fourth* Number of the Proceedings was remarkably small, the Council, on the recommendation of the Committee of Publication, have ordered 250 copies of that Number to be reprinted, by which means a large stock of complete copies of the first Volume has been made up for the supply of future demands, and for sale to Members and others at a fixed price.